NOV 15 1993 EPDS

Case Number	2 Investigator ID	3 Office Code	
930916CCC2588	8 6 8 9	8 3 0	EPIDEMIOLOGIC INVESTIGATION REPORT
Accident date	5 IDI initiated		
8 9 0 6 0 5	9 3 0 9 3 0		

Syncpsis of Accident or complaint 2 adults and 3 children had exposure to basement window screens. Apparently there is off-gassing going on with the screens that caused varicus health problems for all individuals living in the home.

Location	8 City	9 State
HOME 1 0	CLARKSTON	M I
0a First Product	11a Trade/Brand name/Model	
WINDOW SCREENS 1 8 2 8	PHIFER WIRE PRODUCTS, INC P.O. BOX 1700 - TUSCALOOSA, AL 35403-1700	
0b Second Product	11b Trade/Brand name/Model	
NONE 0 0 0 0	NA	

2 Age of Victim *	13 Sex	14 Disposition	15 Injury diagnosis
0 4 8	2	TREATED 0 2	FOREIGN SUBSTANCE 5 6

6 Body part	17 Respondents	18 Investigation type	19 Time spent
ALL 8 5	COMPLAINANT 1	PHONE 2	1 4 . 0

0 Attachments	21 Case Source	22 Reviewed by/Date
DOCUMENTS 2	CONS. COMPLAINT 0 7	8311 11/8/93

3 Permission to disclose names (Non-NEISS cases only)
___ CPSC may disclose my name XXX CPSC may not disclose my name

4 Narrative

25 Regional Director review date

PRE-ACCIDENT

On 5 May, 1989 the consumer had window screens installed in her home. The screens were manufactured by Phifer Wire Products. After one after the screens were installed, all family members had various health problems. The family members include a 50 year old husband, the 48 year old female complainant, a 20 year old female daughter, a 20 year old son, and a 9 year old adopted son. The family's symptoms are cited below and are categorized by affected area:

EYES

burning - most noticeable in the morning. Visual scotomata - black spots, photophobia - sensitivity to daylight, dryness of the eyes.

930916CCC2588

her visual problems include red eyes, blurring vision, decreased visual acuity (3 family nbers needed glasses, 1 needed a stronger prescription. NOTE: as per the optometrist, esight of family members improved when odorous screens were removed.

RESPIRATORY

y cough, unable to take a deep breath, shortness of breath, tightness in chest, raspy throat, re throat, hoarseness, development of asthma, wheezing, productive cough, post nasal drip, ody nose, sinus infections, coughing up blood tinged fluid, bronchitis, complete loss of ell.

GASTRIC AND INTESTINAL

inding of teeth, clenching of teeth, need for 5 root canals in one year, TMJ, pain under ngue, loss of taste, taste like Tin or Metal in mouth, loss of appetite, itching of the roof mouth, burning of mouth and tongue, unable to move tongue to form words, swollen lips, treme thirst, burning and cracking of lips, regurgitation of food, canker sores, heartburn, dominal pain. Both complainant and her husband were prescribed Zantac, constipation, loss of l feeling of any intestinal movement - after 7-10 days of constipation (unresolved by diet, ber, laxatives, or enema) - only Magnesium Citrate would work, diarrhea, stools turned ite/clay colored over 1 year - returned to normal after screens were removed, blood in ools.

MISCELLANEOUS SYMPTOMS

oking feeling in throat, husband felt like he had a growth in his throat, Symptom was ecked by ENT physician. Symptoms now gone. The 9 year old needed counseling. He said that omething was in his room." The 9 year old developed asthma during the time, but no asthma mptoms when screens were removed.

ACCIDENT

e above cited symptoms started 1 month after the screens were in place. The screens were in ace from May 5, 1989 until 2 June 1992.

POST ACCIDENT

e family tried to determine what was causing their problems. Family members were seen by a ysician (medical reports are not available as they are in the hands of an attorney). Through ial and error, the family discovered that the window screens were off-gassing when exposed to nlight. The window screens were tested and revealed that the following emissions were found: etone, benzene, chloro benzene, styrene plastos, toluene, plthlic anhydride, acetic acid, hyl hexanol and various aromatic hydrocarbons. The consumer wrote to Phifer Wire Products d discovered that the firm replaced a "tie basic lead phosphate" with calcium cadmium zinc abilizer in aliphatic solvent. This was done around 1988.

e family had the screens replaced with galvanized screens with an anodized covering. Since at time that family's symptoms have virtually disappeared.

e consumer has been in close contact with the Michigan Department of Public Health in nsing, Mich. Specifically, Dr. Kirpal Sidhu (toxicologist) is the individual at the public alth department that the consumer has been in contact with. Dr. Sidhu provided the following cumentation to this investigator and this information is enclosed as exhibits:

ENCLOSURES

CORRESPONDENCE:

1. A letter from Mr. Charles E. Morgan to Mr. Tim Battersby (June, 1992)

2. A memo from Nelson Haynes to Carol Chase (Oakland County, July 22, 1992)

3. A letter from Ms. Mary S. Golarz to Dr. Kamrin (September 9, 1992)

4. A note from Mr. & Mrs. Mary Joseph Golarz (September 10, 1992)

5. A letter from Mr. Charles Morgan to Ms. Karen Manuel (September 25, 1992)

6. A letter from Mrs. Mary S. Golarz to Dr. Sidhu. (October 7, 1992)

7. A letter from Dr. Kirpal S. Sidhu to Mr. Freeman (CPSC, Washington D.C., October 16, 1992)

8. A letter from Dr. Kirpal S. Sidhu to Mr. David Schmeltzer (Attn: Ms. Judith Hayes, November 5, 1992)

9. A letter from Ms. Beverly C. Phifer to Mrs. Mary S. Golarz (December 8, 1992)

10. A letter from Mr. Charles Morgan to Mrs. Mary Golarz (February 23, 1993)

11. A letter from Mrs. Mary S. Golarz to Dr. Kirpal S. Sidhu (April 11, 1993)

12. A letter from Mrs. Mary S. Golarz to Susan Cole, University of Michigan, April 12, 1993)

13. A letter from Mr. Charles Morgan to Mrs. Mary S. Golarz (April 16, 1993)

14. Media inquiry report (John L. Hesse, Michigan Department of Public Health, April 29, 1993)

15. A letter from Dr. Kirpal S. Sidhu to Mr. Robert Axelrad, Director, Indoor Air Division, US EPA (May 7, 1993)

16. A letter from Dr. Kirpal S. Sidhu to Dr. Robert Verhalen (CPSC Bethesda, Maryland, May 7, 1993)

17. A letter from Mrs. Mary S. Golarz to Dr. Sidhu (June 15, 1993)

0916CCC2588

determination of volatile emissions from Suntrol window screen material. Health Effects oup, Inc (Nov 25, 1991)

Study by Robert G. Meeks (Jan 15, 1992).

Study by Robert G. Meeks (Feb 21, 1992).

Supplementary report: Analysis of vinyl coated fiberglass samples.

Indoor air quality investigation done at consumer's house in Hatfield, Mass

Self-Help - special IAQ study for Dr. Sidju. Analysis of indoor air samples conducted by cupational Health Lab , Mich Dept of Public Health.

Emissions from polymer coated fiberglass screening material.

Indoor air quality evaluation at three selected home in southeastern Mich for Phifer Wire oducts, Inc - Clayton Project No. 45870.00 (Apr 13, 1993).

Dynamic Environmental Chamber Lab Study for Phifer Wire Products, Inc. Tuscaloosa, Ala. ayton Project No. 46431.00 ()May 25, 1993).

. Various letter of correspondence.

PRODUCT IDENTIFICATION

ıe product are polymer coated fiberglass window screens manufactured by Phifer Wire Products ıc in Tuscaloosa, Ala. The product is not coded in any way.

STATE OF MICHIGAN

4130116 C.CC.2583

JOHN ENGLER, GOVERNOR

DEPARTMENT OF PUBLIC HEALTH

3423 N. LOGAN/MARTIN L. KING JR., BLVD.
P.O. BOX 30195, LANSING, MICHIGAN 48909
Vernice Davis Anthony, Director

November 2, 1993

Mr. Rudy Trostman
Consumer Products Safety Commission
477 Michigan Avenue
Room M5
Detroit, Michigan 48226

Dear Mr. Trostman:

This follows my letter of October 20, 1993. I am glad that CPSC has accepted our request of October 16, 1992 to investigate the alleged indoor air problem attributed to replacement screens manufactured by Phifer Wire Products Inc., P.O. Box 1700, Tuscaloosa, Alabama 35430-1700 prior to June 1989 (between 1988-89) and distributed in this state by Weathervane Window Incorporated, 4th Court, Brighton.

I have enclosed information about alleged indoor air problem from my files. A list of compiled items is also enclosed. This is classified into two categories namely studies and correspondence. I hope this information is useful.

As I mentioned earlier in my letter of October 20, 1993 and two telephone conversations (October 19, 1993 and November 1, 1993) we will work actively in cooperation with you to investigate this alleged indoor air problem. Please stay in touch.

Yours Sincerely,

Kirpal S. Sidhu

Kirpal S. Sidhu, Ph.D., Toxicologist
Division of Health Risk Assessment
Telephone 517-335-8362
Fax 517-335-9434

Enclosures

cc: F. Watt
A. Bloomer
J. Hesse
N. Haynes/Oakland County Hlth. Dept.

ENCLOSURES

STUDIES:

1. Determination of volatile emissions from Suntrol window screen material. Health Effects Group, Inc. (November 25, 1991)

2. Study by Robert G. Meeks (Letter from Robert G. Meeks to Mr. Anthony Gamble, January 15, 1992)

3. Study by Robert G. Meeks (Letter from Robert G. Meeks to Mr. Anthony Gamble, February 21, 1992)

4. Supplementary report: Analysis of vinyl coated fiberglass samples (Letter from Mr. Charles Morgan to Mr. Bob Hoff, February 20, 1992)

5. Indoor air quality investigation: Geryk's residence, Hatfield, Massachusetts (October 9, 1992)

6. Self help: Public - special IAQ study for Dr. Sidhu. Analyses of indoor air samples conducted by the Occupational Health Laboratory, Michigan Department of Public Health (January 8, 1993).

7. Emissions from Polymer coated fiberglass screening material: A summary of study findings, Health Effects Group Inc. (April 27, 1993)

8. Indoor air quality evaluation at three selected homes in southeastern Michigan for Phifer Wire Products, Inc. Tuscaloosa, Alabama - Clayton Project No. 45870.00 Draft Report (April 13, 1993)

9. Dynamic Environmental Chamber Laboratory Study for Pfifer Wire Products, Inc., Tuscaloosa, Alabama. Clayton Projects No. 46431.00 (May 25, 1993). A letter from Stephen D. Paull to Charles E. Morgan (May 25, 1993)

18. A letter from Mrs. Mary S. Golarz to Dr. Sidhu (September 15, 1993)

19. A letter from Dr. Kirpal S. Sidhu to Ms. Karin Nanos (September 21, 1993)

20. A letter from Mrs. Mary S. Golarz to Mr. Hesse (October 1, 1993)

21. A letter from Dr. Kirpal S. Sidhu to Mr. Rudy Trostman (CPSC, Detroit, Michigan, October 20, 1993)

22. A letter from Dr. Kirpal S. Sidhu to Dr. Robert Verhalen CPSC, Bethesda, Maryland, October 20, 1993)

23. A letter from Dr. Kirpal S. Sidhu to Mr. David Schmeltzer, CPSC, Washington, D.C., October 20, 1993.

24. A letter "To Whom it May Concern" prepared by Mrs. Mary S. Golarz (no date)

STATE OF MICHIGAN

930916CCC 7558

JOHN ENGLER, GOVERNOR

DEPARTMENT OF PUBLIC HEALTH

3423 N. LOGAN/MARTIN L. KING JR., BLVD.
P.O. BOX 30195, LANSING, MICHIGAN 48909
Vernice Davis Anthony, Director

October 20, 1993

Mr. Rudy Trostman
Consumer Products Safety Commission
477 Michigan Avenue, Room M5
Detroit, Michigan 48226

Dear Mr. Trostman:

This follows our telephone conversation of October 19. I am glad that CPSC has accepted our request of October 16, 1992 to investigate the alleged indoor air problem attributed to replacement screens, manufactured by Pfifer Wire Products, Inc., P.O. Box 1700, Tuscaloosa, Alabama 35430-1700, prior to June 1989 (between 1988-89) and distributed in this state by Weathervane Window Incorporated, 4th Court, Brighton. The alleged problem may exist in some other states also.

I will compile information about the alleged problem and mail copies of all pertinent documents to you next week.

Nelson Haynes (Oakland County Health Department), John Hesse (Michigan Department of Public Health) and myself will actively work and fully cooperate with you and other members of the CPSC in the investigation of this alleged indoor problem.

I look forward to working together.

Sincerely,

Kirpal S. Sidhu

Kirpal S. Sidhu, Ph.D.
Toxicologist
Division of Health Risk Assessment
Telephone 517-335-8362
FAX 517-335-9434

cc: F. Watt
A. Bloomer
J. Hesse
N. Haynes

HEALTH EFFECTS GROUP, INC.
P.O. Box 31778 Tucson, Arizona 85717 (602) 888-4442

Toxicology
Environmental Health
Industrial Hygiene

93-916-C-C-2588

DETERMINATION OF VOLATILE EMISSIONS FROM SUNTROL WINDOW SCREEN MATERIAL

Suntrol Window Products
Suite 6
3767 E. Broadway
Phoenix, Arizona 85040

November 25, 1991

Clifton D. Crutchfield

Clifton D. Crutchfield, Ph.D.
Certified Industrial Hygienist

November 27, 1991
date

BACKGROUND

This analysis was generated in response to a request from John Edwards, President of Suntrol Window Products, concerning volatile emissions from degraded PVC window screens that had been installed by Suntrol. The visible degradation of installed screens was accompanied by a strong odor. Employee health complaints had been registered during removal and subsequent processing of the degraded screens.

Concern about possible adverse health effects associated with employee exposures to the volatile emissions generated the request to attempt a characterization of the emissions. It was noted during phone conversations with Mr. Edwards that the odor from the screens was more predominant during hot weather, and when large amounts of the degraded screen material were stored pending return to the manufacturer.

METHODOLOGY

Two sample panels of degraded screen material (approximately 1.5 square meters) were delivered by express carrier to the HEG office on 11-6-91. The panels was held in the carrier package at room temperature until 11-8-91, at which time approximately one-half of each panel was transferred into a 4 liter glass chamber for volatile emission sample collection. Prior to insertion of the screen samples, the glass chamber was cleaned and rinsed with distilled water.

The initial sampling strategy involved concentrating volatile emissions from the screen panels onto activated charcoal and silica gel adsorption tubes. The glass chamber was sealed with an aluminum foil cap containing three sampling ports. A glass tube was inserted through one port to the bottom of the chamber. This tube served as the source of make-up air during sample collection. The remaining two ports were used for the activated charcoal and silica gel vapor adsorption tubes used to collect volatile organic compound (VOC) emissions from the screen material.

Adsorption tube sampling was conducted outdoors to minimize potential interferences from the sample make-up air. The general air flow pattern during sampling was from the ambient environment into the bottom of the glass chamber, through the screen panels, and into the vapor adsorption tubes.

Both an activated charcoal tube (SKC 226-400/200 mg) and a silica gel tube (Supelco Orbo 53) were used for VOC adsorption. A sample flow rate of 0.6 liters/min over a sampling period of 167 minutes yielded a total sample volume of 100 liters through each adsorption tube. An identical sample collection train was used outside the glass chamber to collect simultaneous control samples of ambient air in the immediate vicinity of the sample chamber.

CONCLUSIONS

Gas chromatographic/mass spectral analysis showed that the primary volatile emissions detected in the head space of degraded PVC screen material were ketones, with methyl ethyl ketone and methyl vinyl ketone being the most predominant. While these compounds do not appear to be acutely toxic, they can be skin and respiratory system irritants with powerfully penetrating odors.

In the absence of information on actual exposure levels to these compounds during handling and processing of the degraded screen material, precautions to preclude excessive skin and respiratory exposures should be taken.

January 15, 1992

Mr. Anthony Gamble
Phifer Wire Products, Inc.
P.O. Box 1700
Tuscaloosa, AL 35403-1700

~~Bob Hoff~~
3-pages

Dear Anthony:

Below is a discussion of the progress we have made in assessing the source of the odor associated with the polymer coated fiberglass screening material you recently sent to us.

In order to qualitatively describe odors believed to be originating from polymer coated fiberglass screen material our laboratory utilized approximately 30 square centimeter samples of various aged and non-weathered screen material cut into 1 cm square pieces as representations of the bulk material.

These samples were introduced into glass vials and sealed with teflon crimp cap seals. The glass vials were placed in a Hewlett-Packard model 19354 Headspace Analyzer which was interfaced to a Hewlett-Packard model 5890 Gas Chromatograph using a Hewlett-Packard model 5971 Mass Spectrometer as detector. The column in the gas chromatograph was a 25 meter HP5. The headspace sampler was set to a total carrier flow of 90 ml/min, with auxiliary pressure set at 1.4 bar. The sample loop in the headspace analyzer had a 1 ml total volume. The split ratio on the gas chromatograph was 1:4, with a column head pressure of 4 psi. The gas chromatograph was operated isothermally at 120 degrees centigrade. The mass spectrometer scanned from 30 to 500 m/z.

Headspace optimization included sampling a mixed composite of aged and non-weathered samples of screen material at temperatures ranging from 50 degrees centigrade to 120 degrees centigrade. It was found that peak height of compounds originating from these samples increased with temperature until 110 degrees. At temperatures higher than this a broad non-specific peak appeared indicating possible degradation of the polymer material.

Analyses carried out on aged and non-weathered samples presented evidence that release of compounds from the samples increases with weathering. That is, weathered samples produced peak heights 10 -

The University of Alabama at Birmingham
309 Tidwell Hall • 720 South 20th Street • OAB Station
Birmingham, Alabama 35294-0008 • (205) 934-7032 • FAX (205) 975-6341

200 times larger than non-weathered samples.

The peaks from the gas chromatograph of these materials exhibited very low retention times indicating low mass, low boiling point, and possibly polar materials. Also, the peak areas were too small to obtain reliable mass spectral identification. However, comparison of these mass spectra with NBS standards indicated the following compounds as tentatively identified:

COMPOUND	CAS #
Ethanone, 1-cyclobutyl-	3019258
3-octen-2-one, 7-methyl-	33046810
1-Butanol, 3-methyl-, acetate	123922
2H-Pyran, 3,4-dihydro-6-methyl	16015115
[2,2'-Bifuran]-5,5'-dicarboxylic acid, 4	5905033
Propanamide, 2-methyl-	563837
1,2-Benzenedicarboxylic acids:	
diisooctyl	27554263
3-nitro	603112
diundecyl	3648202
diisodecyl	26761400
diheptyl	3648213
Aspidofractinine-3-methanol, (2.alpha.3	2656442

These compounds appear to be oxidation products of monomer material coated onto the fiberglass screen, various phthalates associated with plasticizers used in the manufacture of the polymer, and pigment used in coloring the screen material.

It cannot be overstressed that these are only tentative identifications. In order to further define these materials, a larger sample loop has been installed on the headspace analyzer, and a more polar column has been installed in the gas chromatograph. This should allow us to introduce more of the sample into the gas chromatograph/mass spectrometer, and allow for better separation of these oxidation products. Work is continuing on screen materials and on hand tool materials associated with screen installation.

We are in the process of re-analyzing these samples utilizing the modifications described above. We should have the results these analyses by the end of this week or the first part of next week. I will forward the results as soon as possible.

If you would like me to discuss the possible health effects of these compounds with any of your customers, please let me know and I will be more than happy to do so.

Sincerely yours,

Robert G. Meeks

UAB SCHOOL OF PUBLIC HEALTH

Department of Environmental Health Sciences

February 21, 1992

Mr. Anthony Gamble
Phifer Wire Products, Inc.
P.O. Box 1700
Tuscaloosa, AL 35403-1700

Dear Anthony:

We have essentially completed our assessment of the source of the odors associated with the polymer coated fiberglass screening material you recently sent to us.

In order to qualitatively describe the odors believed to be originating from the polymer coated fiberglass screen material, the initial studies in our laboratory utilized approximately 30 square centimeter samples of various aged and non-weathered screen material cut into 1 cm square pieces as representations of the bulk material.

These samples were introduced into glass vials and sealed with teflon crimp cap seals. The glass vials were placed in a Hewlett-Packard model 19354 Headspace Analyzer which was interfaced to a Hewlett-Packard model 5890 Gas Chromatograph using a Hewlett-Packard model 5971 Mass Spectrometer as the detector. The column in the gas chromatograph was a 25 meter HP5. The headspace sampler was set to a total carrier flow of 90 ml/min, with auxiliary pressure set at 1.4 bar. The sample loop in the headspace analyzer had a 1 ml total volume. The split ratio on the gas chromatograph was 1:4, with a column head pressure of 4 psi. The gas chromatograph was operated isothermally at 120 degrees centigrade. The mass spectrometer scanned from 30 to 500 m/z.

Headspace optimization included sampling a mixed composite of aged and non-weathered samples of screen material at temperatures ranging from 50 degrees centigrade to 120 degrees centigrade. It was found that peak height of compounds originating from these samples increased with temperature until 110 degrees. At temperatures higher than this a broad non-specific peak appeared indicating possible degradation of the polymer material.

Analyses carried out on aged and non-weathered samples presented evidence that release of compounds from the samples increases with

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weathering. That is, weathered samples produced peak heights 10 - 200 times larger than non-weathered samples.

In these initial studies, the peaks from the gas chromatograph of these materials exhibited very low retention times indicating low mass, low boiling point, and possibly polar materials. Also, the peak areas were too small to obtain reliable mass spectral identification. However, comparison of these mass spectra with NBS standards indicated the following compounds as tentatively identified:

COMPOUND	CAS #
Ethanone, 1-cyclobutyl-	3019258
3-octen-2-one, 7-methyl-	33046810
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[2,2'-Bifuran]-5,5'-dicarboxylic acid, 4	5905033
Propanamide, 2-methyl-	563837
1,2-Benzenedicarboxylic acids:	
diisooctyl	27554263
3-nitro	603112
diundecyl	3648202
diisodecyl	26761400
diheptyl	3648213
Aspidofractinine-3-methanol, (2.alpha.3	2656442

These compounds would appear to be oxidation products of monomer material coated onto the fiberglass screen, various phthalates associated with plasticizers used in the manufacture of the polymer, and pigment used in coloring the screen material.

It cannot be overstressed that these were initial studies and were only tentative identifications. In order to further characterize material believed to be released from vinyl coated screens we installed a 3 ml sample loop on a Hewlett-Packard Headspace sampler interfaced to a Hewlett-Packard 5890 Gas Chromatograph using a Hewlett-Packard 5970 Mass Spectrometer as the detector,and we installed a more polar column.

Two studies have been completed with this new configuration, specifically, a temperature study and a series of analyses of vinyl coated screen materials. Conditions for the studies were as follows:

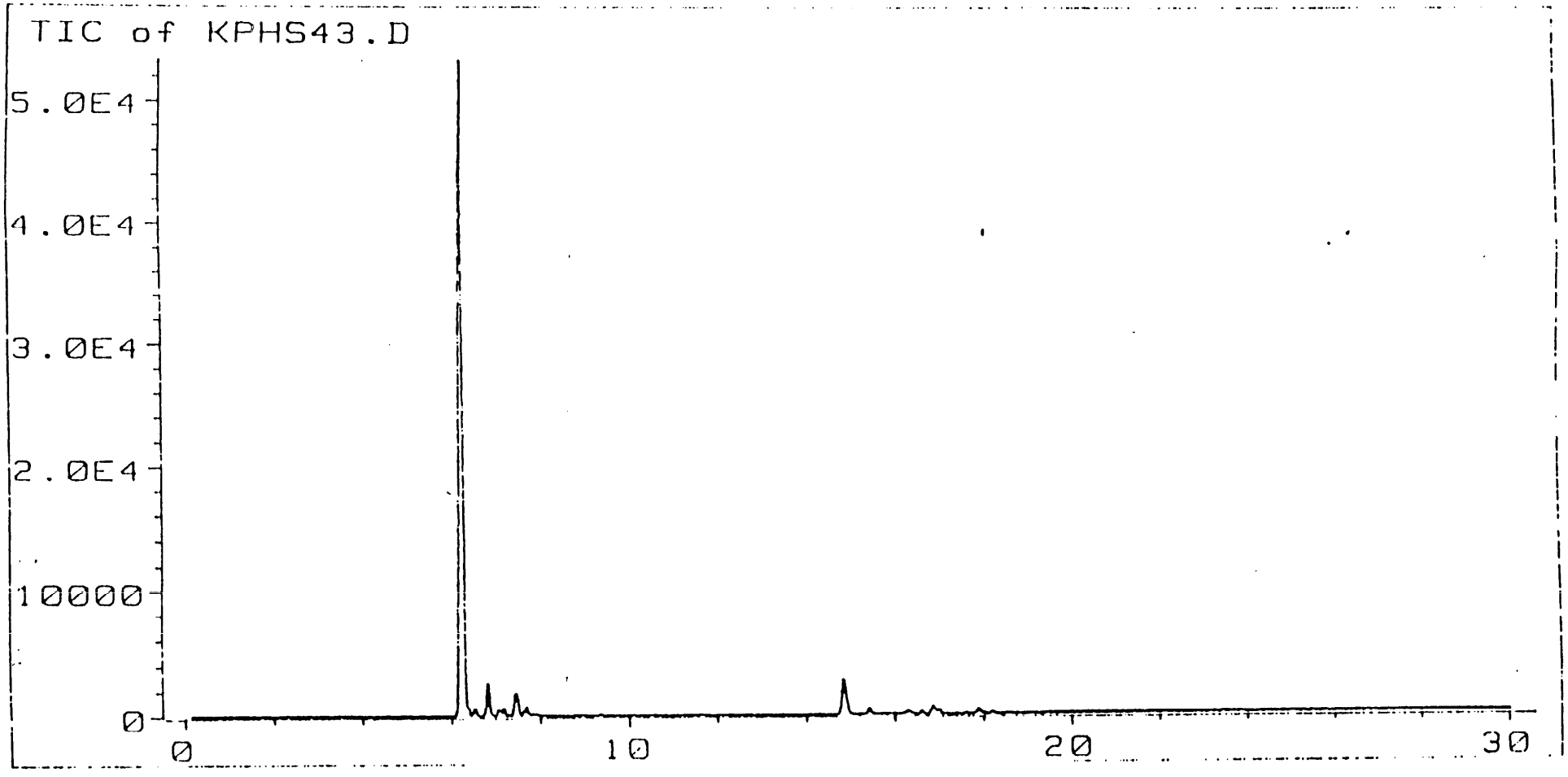
The headspace sampler bath was set at a series of temperatures ranging from 100 to 140 degrees centigrade. Samples were analyzed at 100, 110, 120, 130, and 140 degrees centigrade. Auxiliary flow was set to 1 bar pressure as was the carrier gas. This resulted in a flow of 80 ml/min to the gas chromatograph.

literature for information on the potential adverse health effects that might result from exposure to these materials. As I suspected there was very little information in the literature as to the human toxicity of these compounds. However, it is well recognized that compounds such as these (i.e. ketones, amines, and weak organic acids) can be strong irritants to the nose, eyes, upper respiratory tract, and mucous membranes. Signs and symptoms related to exposure to these compounds might in some cases mimic those of a cold or flu. These would consist of eye irritation or red eyes, a runny nose, a raspy feeling in the throat, some hoarseness, and possibly bronchitis. Since these are all irritant effects it is to be expected that once the offending agent was removed, then these symptoms should reverse themselves and the health status should revert back to normal. It is important to stress that chronic or long-term effects resulting form exposure to these agents is not to be expected.

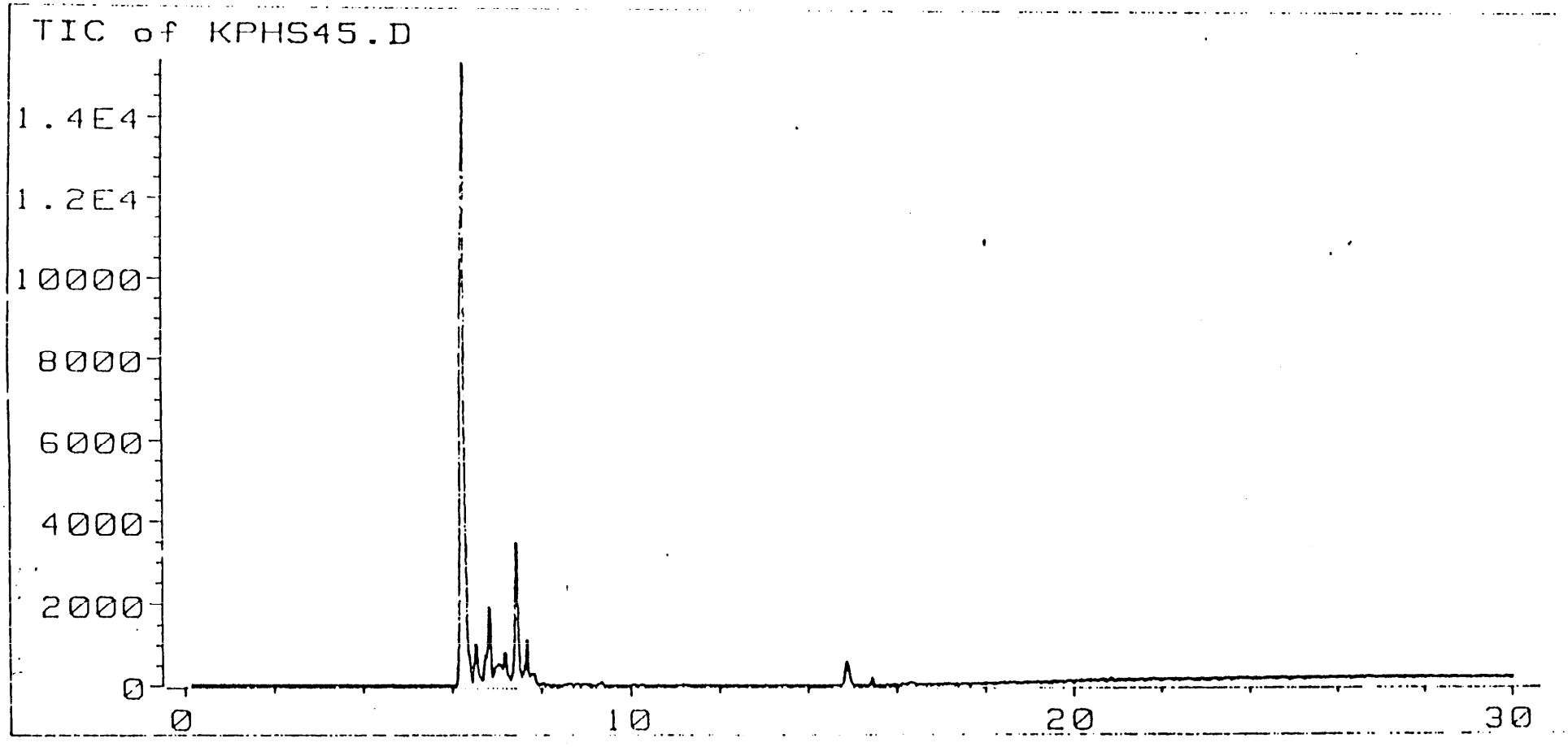
I hope this provides you with the information needed. If you have any questions concerning our analyses and/results or need any additional information, please do not hesitate to contact me. As always, I remain

Sincerely yours,

Robert G. Meeks, Ph.D., D.A.B.T.



BRONZE VINYL COATED FIBERGLASS



GRAY VINYL COATED FIBERGLASS FROM MAILING TUBE

LIBRARY SEARCH RESULTS

Peak 1

Scan 344 (6.322 min) of KPHS45.D
GRAY VINYL COATED FIBERGLASS FROM MAILING TUBE

Library file: DATA:NBS_REVE.L
Library name: NBS MASS SPECTRAL DATABASE

		CAS #	Library Index #	Match Quality
1:	2-Pentanamine, 4-methyl- (9CI)	108098	1391	9794
2:	2-Hexanamine, 4-methyl- (9CI)	105419	2523	9785
3:	2-Butanamine, 3-methyl- (9CI)	598743	686	9771
4:	Dodecanoic acid, 11-amino-, methyl ester	56817926	19553	9771
5:	2-Heptanamine (9CI)	123820	2525	9764
6:	2-Butanamine, 3,3-dimethyl- (9CI)	3850304	1398	9761
7:	2-Hexanamine (9CI)	5329793	1401	9754
8:	Cyclopropane, 1-bromo-1,2-dichloro- (8CI	24071634	13622	9733
9:	Cyclopropane, 1,1-dibromo-2-chloro-2-flu	24071576	22007	9733
10:	Phenol, 4-[2-(methylamino)ethyl]- (9CI)	370989	7330	9726

RETRIEVE
Which match (1 to 10):

Y: Set of 4 MS
X: Scan 344 (6.322 min) of KP

LIBRARY SEARCH RESULTS

Scan 391 (7.204 min) of KPHS4S.D
GRAY VINYL COATED FIBERGLASS FROM MAILING TUBE Peak 4

Library file: DATA:NBS_REVE.L
Library name: NBS MASS SPECTRAL DATABASE

	CAS #	Library Index #	Match Quality
1: Propane, 1,1'-sulfonylbis- (9CI)	598038	7162	9321
2: 4-Hepten-2-one, (E)- (9CI)	36678430	2150	9318
3: 2-Heptanone, 6-methyl-5-nitro- (9CI)	66972029	11269	9296
4: 2,4-Oxazolidinedione, 5,5-dimethyl- (8CI	695534	4000	9293
5: Propane, 2-methyl- (8CI9CI)	75285	98	9290
6: 4-Penten-2-one (8CI9CI)	13891877	522	9282
7: Butane, 2,2-dichloro-3-methyl- (8CI9CI)	17773669	5489	9241
8: 4H-Pyran-4-one, 3,5-diacetyltetrahydro-2	55030665	17148	9239
9: 2,3-Pentanedione, 4-methyl- (8CI9CI)	7493585	2346	9195
10: Acetic acid, 2-propenyl ester (9CI)	591877	1249	9188

RETRIEVE
Which match (1 to 10):

Y: #5489 Butane, 2,2-dichloro
X: Scan 391 (7.204 min) of KP

LIBRARY SEARCH RESULTS

Scan 404 (7.436 min) of KPHS4S.D
GRAY VINYL COATED FIBERGLASS FROM MAILING TUBE
Peak 5

Library file: DATA:NBS_REVE.L
Library name: NBS MASS SPECTRAL DATABASE

	CAS #	Library Index #	Match Quality
1: Ethanone, 1-cyclobutyl- (9CI)	3019258	1083	8954
2: 3-Octen-2-one, 7-methyl- (9CI)	33046810	5670	8842
3: 1-Butanol, 3-methyl-, acetate (9CI)	123922	4155	8543
4: Cyanic acid, 2,2-dimethylpropyl ester (9	1459445	2250	8541
5: 2-Pentanone, 3-methylene- (8CI9CI)	4359777	1088	8514
6: 2H-Pyran, 3,4-dihydro-6-methyl- (8CI9CI)	16015115	1098	8500
7: 3-Hepten-2-one (8CI9CI)	1119444	2110	8480
8: 3-Butyn-2-ol (8CI9CI)	2028639	214	8405
9: 1-Propanone, 2-methyl-1-[2-(1-methylethy	56259155	7837	8394
10: 5-Undecene, 8-methyl-, (E)- (9CI)	39546855	10358	8373

RETRIEVE
Which match (1 to 10):

Y: #5670 3-Octen-2-one, 7-met
X: Scan 404 (7.436 min) of KP

PHIFER WIRE PRODUCTS, INC.
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■ CHARLES E. MORGAN
Executive Vice President and Corporate Counsel

February 20, 1992

Mr. Bob Hoff
6890 Sun Valley Drive
Clarkston, Michigan 48348

Dear Mr. Hoff:

It has been exactly three weeks since you and I spoke regarding the odor problems with our fiberglass screens. Immediately after speaking with you, I faxed you a copy of a letter (progress report) dated January 15, 1992 from our toxicologist, Dr. Robert G. Meeks. You had previously received, through attorney Louis Corey, a copy of Dr. Clifton Crutchfield's report dated November 27, 1991. During our conversation, you informed me that you and the Chases no longer employ Mr. Corey and that I should send information directly to you.

I believe I told you that we were expecting a final detailed report from Dr. Meeks that would be more in depth than Dr. Crutchfield's report. I may have also told you that I had met with Dr. Meeks the week before (January 22) at which time he had provided me with a "Supplementary Report" on his "Analysis of vinyl coated fiberglass samples." Due to the technical nature of this Supplementary Report, it is not comprehensible to me. Dr. Meeks offered to wrap it all up with a final narrative report that would be written in terms that a non-scientist could understand. He suggested that I wait until that final report was available and then send it to you along with the Supplementary Report. I called Dr. Meeks three days ago to ask about this final report and he told me that he should have it out in "a week or two." Since I do not know exactly how long that "week or two" will be, and I did not want you to think we had forgotten about you, I decided to go ahead and send you the enclosed copy of Dr. Meeks' Supplementary Report. Dr. Meeks mentioned that he had received a phone call from Carol Chase earlier this month. I do not have Mrs. Chase's address, so I have enclosed an extra copy of this letter and report and would appreciate it if you would pass them along to her.

Although, as previously admitted, I don't really understand the technical findings, the bottom line of Dr. Meeks' message seems to be that we should have no serious concerns regarding toxicity or permanent adverse effects from these odors. I will send you copies of Dr. Meeks' final report as soon as I get it. In the meantime, feel free to call me or Dr. Meeks if you have any questions.

Sincerely yours,

Charles Morgan

Charles Morgan

Enclosures

DR HEERS AT PWP
22 JAN 92
ALSO PRESENT:
JOHN STUHFF
CHARLES MORGAN

Supplementary Report
Analysis of vinyl coated fiberglass samples

Introduction

In order to further characterize material believed to be released from vinyl coated screens we installed a 3 ml sample loop on a Hewlett-Packard Headspace sampler interfaced to a Hewlett-Packard 5890 Gas Chromatograph using a Hewlett-Packard 5970 Mass Spectrometer as the detector.

Experimental Conditions

Two studies have been completed with this new configuration, specifically, a temperature study and a series of analyses of vinyl coated screen materials. Conditions for the studies were as follows:

The headspace sampler bath was set at a series of temperatures ranging from 100 to 140 C. Samples were analyzed at 100, 110, 120, 130, and 140 C. Auxiliary flow was set to 1 bar pressure as was the carrier gas. This resulted in a flow of 80 ml/min to the gas chromatograph.

The gas chromatograph was set to a split vent flow of 20 ml/min resulting in a total of 100 ml/min flow. The purge vent was set to 5 ml/min resulting in a 1:20 split ratio. The gas chromatograph was operated at 120 C initially for 7 minutes then ramped to 250 C at 10 C per minute, then programmed to remain at that temperature for 10 minutes. A Hewlett-Packard FFAP 50 meter x 0.2 uM column was installed for these analyses.

The mass spectrometer was programmed to scan from 35 to 450 M/Z.

For the series of vinyl coated samples, the headspace sampler operated at 140 C. Each sample consisted of approximately 24 square inches of material rolled into the headspace sampler vial.

Results

Increasing temperature of the headspace sampler resulted in successively higher amounts of degradation materials to be transferred to the gas chromatograph. Seven peaks were predominant in this series of samples, indicating at least seven separate compounds. There were also several other small peaks with signals too low to provide sufficient qualitative information for characterization.

Three samples of differing materials were analyzed at 140 C. These included the bronze vinyl coated fiberglass from Arizona, the gray vinyl coated material included with the bronze material, and another sample of gray vinyl coated material from a round mailing tube. Each of these samples exhibited similar chromatographic behavior. That is, they all exhibited the same seven peaks as shown on the associated chromatographs.

The mass spectra of each of these peaks was matched with NBS standard spectra and the ten best matches were listed for each peak. It can been inferred from this data that these compounds represent oxidation products of the vinyl material and associated plasticizers. The spectral matches for the gray vinyl coated fiberglass are included with this report.

It can be envisioned that different product ratios can be formed depending on environmental conditions. The major product appears to be a small molecular weight ketone, amine or acid formed from oxidative cleavage of HCL from the polyvinylchloride. This can result in the formation of chlorinated polyenes, low molecular weight compounds such as propanes, cyclopropanes and butanes, cyclobutanes, and their associated acids. These compounds typically exhibit high vapor pressures, thus the odors associated with aging of the vinyl coating.